

Application No. 09/624,810
Docket No. 13DV-13228
Amendment dated May 25, 2004
Reply to Office Action of March 24, 2004

Applicants' independent claim 1 requires:

a coating material [26] surrounded by and contained within the crucible [56], the coating material [26] having a surface exposed by the crucible [56];

an electron beam gun [30] projecting an electron beam [28] onto the surface of the coating material [26], the electron beam [28] defining a beam pattern having a higher intensity *at an interface* of the surface of the coating material [26] with the crucible [56] than at a central region of the surface of the coating material [26]. (Emphasis added.)

Applicants' independent claim 6 requires:

a coating material [26] surrounded by and contained within the crucible [56], the coating material [26] having a surface exposed by the crucible [56];

an electron beam gun [30] projecting an electron beam [28] onto the surface of the coating material [26] *and a contiguous surface portion [84] of the crucible [56]*, the electron beam [28] forming a beam pattern with a perimeter *on the contiguous surface portion [84] of the crucible [56]*, the electron beam gun [30] melting the surface of the coating material [26] and evaporating molten coating material [26], the electron beam [28] having a higher intensity *at an interface* of the surface of the coating material [26] with the contiguous surface portion [84] of the crucible [56] than at a central region of the surface of the coating material [26], the electron beam [28] being incident on the surface of the coating material [26] at an oblique angle so as to establish relative to the electron beam gun [30] a proximal point [100] and an oppositely-disposed distal point [101] at the perimeter of the beam pattern, the electron beam [28] having a lower intensity at the proximal and distal points [100,101] than elsewhere at the perimeter of the beam pattern. (Emphasis added.)

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Under the §102 rejection, the Examiner cited Dietrich as disclosing an electron beam melting furnace equipped with a crucible 6 containing a bath 8 of molten evaporate, and electron beams 17 and 18 generated by electron beam guns 10 and 11, with which Applicants agree. However, the Examiner has again argued that

Each electron beam gun having a higher intensity at a location between the surface of the coating material and the crucible than at a central region of the surface of the coating material . . .

Applicants presume that by "at a location between the surface of the coating material and the crucible," the Examiner means the interface between Dietrich's crucible 6 and coating material 8, since "interface" is the term used in Applicants' claims. The ordinary meaning of the word "interface" is "a point where two things meet and interact." *Oxford University Press*. Therefore, the Examiner's argument is that Dietrich discloses projecting the electron beams 17 and 18 at a point where Dietrich's crucible 6 contacts the coating material 8. However, nowhere does Dietrich disclose this, and therefore Dietrich does not anticipate Applicants' invention recited in independent claims 1 and 6.

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Also under the §102 rejection, the Examiner stated that

Dietrich et al teaches the capability (column 2, lines 53-58; "despite the force urging them radially toward the outside"; column 3, lines 25-30) of projecting each electron beam onto a surface portion of the crucible contiguous with the "bath of molten evaporate" (column 2, lines 40-55).

However, Dietrich discloses that

the electron beams 17,18, on the basis of an ion concentration in the area of electrode 4, are shifted in the direction of arrows 20,21 toward the electrode. (Emphasis added.)

As evident from Figure 1, shifting of the beams 17 and 18 toward the electrode 4 has the effect of forcing the beams 17 and 18 in a radially outward direction relative to the axes of the electron beam guns 10 and 11. Therefore, from Dietrich's teachings it is clear that the phrase "radially toward the outside" does not mean the beams 17 and 18 are forced toward the outside of the crucible 6, but instead refers to the electrode 4 forcing the beams 17 and 18 radially outside relative to the guns 10 and 11, which is radially inward toward the center of the crucible 6 and therefore away from the edges 14 and 15 of the crucible 6.

For this reason also, Dietrich fails to anticipate Applicants' claimed invention.

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That under no circumstances would Dietrich ever allow the beams 17 and 18 to contact the crucible 6 is clear from column 1, lines 23-25, where Dietrich states

In electron beam melting units, it is important that the electron beam does not strike beside the material to be melted.

For the Examiner to argue that Dietrich discloses or even suggests projecting the beams 17 and 18 onto the crucible 6 is completely contrary to Dietrich's express teachings.

Finally, regarding Applicants' argument that Dietrich fails to disclose "beam intensities at the proximal points (e.g., 36 and 37) and distal points (e.g., 30-33) of Dietrich's beam patterns 26 and 27 would be lower than elsewhere within the beam patterns 26 and 27," the Examiner stated that this limitation is not recited in the rejected claims. To the contrary, this limitation is recited in claims 4 and 6.

In summary, Dietrich does not disclose, and in fact teaches away, from projecting the electron beams 17 and 18 onto the interface between Dietrich's crucible 6 and coating material 8, and therefore Dietrich does not anticipate or obviate Applicants' invention as it is recited in claims 1 through 10.

For all of the above reasons, Applicants respectfully request that their patent application be given favorable reconsideration. The Examiner is asked to call

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Applicants' undersigned representative if he has any questions with respect to the
above, or any other matter now of record.

Respectfully submitted,

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